PVI-AEC-EVO
PVI-AEC-EVO LIGHT
Monitoring System

- USER MANUAL -

QUICK INSTALLATION GUIDE

SAVE THESE DOCUMENT IN A SAFE PLACE!

IMPORTANT SAFETY INSTRUCTION!

This manual contains important safety instruction that must be followed during the installation and start-up of the device. It's recommended to give special attention to the installation instruction in order to reduce the risks pf electric shock and prevent damage to the device.

***Note:** This document contains proprietary information of Power-One, Inc. The contents of this document or any part thereof should not be reproduced or disclosed to any third party whitout Power-One's express written consent.*

***Note:** Any changes / modification not approved by the responsible party could void the user authority to operate the equipment.*

CONTENTS

A. *Product Description* 2

B. *Package Content* 3

C. *User Interface and Use of the Display* 4

D. *Pin-Outs of System Connectors* 5

E. *Power Supply Connections and System Start Up* 6

F. *Date and Time Settings* 7

G. *Connection of the RS485 Line and Inverter Acquisition Check* 7

H. *Configuration of the Analog Inputs* 11

I. *System Configuration for Connection to the LAN Network (Ethernet Port)* 14

L. *Internal Webserver access* 17

M. *Request Form for a New System on Web Portal* 19

N. *Serial Number (S/N) Identification* 20

O. *Firmware Update via Web Portal* 21

P. *Firmware Updating Procedure via SD Card* 22

Appendices

1) *Sensor Connection Diagrams*
2) *RS485 Cable Features*
3) *Display flow-charts*
4) *Compliance Requirements*

A. Product Description

The PVI-AEC-EVO is a monitoring and checking system for photovoltaic systems made with Power-One Aurora products. In the following pages we will make reference to the "system" meaning both versions of the product. Whereas the characteristics of product are different the model will be specified.

The product allows to acquire parameters from the inverter and string-comb (in accordance with the design of the central inverter monitoring system) through the RS485 line with the Power-One proprietary protocol.

The system is equipped with two equivalent RS485 ports and each of them allows a maximum of 62 string inverters or 62 55kW conversion modules (centralized modular inverters) to be acquired; It is also possible to use the communication port RS485/1 (Ref. Par. D) to acquire parameters from "ISKRAMECO MT831" power meters equipped with Modbus communication interface.

Note: *For PVI-AEC-EVO LIGHT, the max number of string inverter manageable by the system is 5, which can be connected only by RS485/2 (Ref. Par. D). Only the followings (in all of their variants) are allowed:*

PVI-2000(-OUTD)	*UNO-2.0/2.5-I-OUTD*	*PVI-3600*
*PVI-3.0/3.6/4.2-TL-OUTD**	*PVI-3.8/4.6-I-OUTD*	*PVI-5000/6000-TL-OUTD**
*PVI-10.0/12.5-TL-OUTD**	*PVI-10.0/12.0-I-OUTD*	

(*): Compatibility is also extended to previous national versions (Ex: PVI-3.6-OUTD-UK)

In the PVI-AEC-EVO LIGHT the communication port RS485/1 (Ref. Par. D) can be used only to acquire parameters from "ISKRAMECO MT831" power meters equipped with Modbus communication interface.

The system is equipped with three analog inputs for the connection of sensors for the measurement of environmental parameters: Power-One offers in its catalogue a complete range of radiation sensor, cell and ambient temperature, speed and wind direction.

The system also has six digital inputs for acquiring state signals (for example auxiliary contacts of power switches) which are associated with state alarm conditions.

With respect to the user interface, the system is equipped with a 2x16 character display and four keys as well as an integrated webserver with html pages which are accessible through LAN connection.

The initial system configuration (check that the inverter parameters are acquired, analog inputs configuration, LAN network parameters configuration) can be carried out completely through the display and keys; for displaying the detailed parameters of the inverters and/or of the string-combs, as well as for the advanced configurations it is necessary to access the pages of the integrated web server.

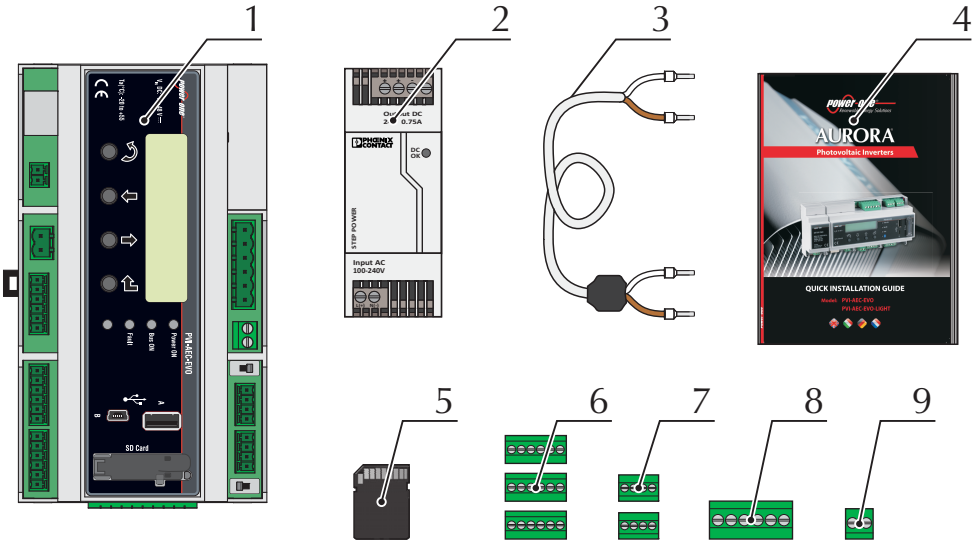
The PVI-AEC-EVO works together with a free web portal service: The system periodically transmits the data to the portal management server and graphically shows the data on web pages which are accessible through an account that can be requested from Power-One customer service.

The portal can also be used for sending alarm, report and FW update notification emails: The system FW can be updated directly through the portal without the need for technical intervention on site.

The FW can also be updated locally without connecting to the portal through the use of SD card.

B. Package content

1	AURORA PVI-AEC-EVO / PVI-AEC-EVO LIGHT
2	Power Supply 100-240Vac 50-60Hz / 24Vdc
3	Power Supply connection cable
4	Quick Installation Guide
5	SD Card (assembled)
6	I/O Terminal Blocks Counterparts (assembled)
7	RS485 Terminal Blocks Counterparts (assembled)
8	Relais Terminal Blocks Counterparts (assembled)
9	Power supply Terminal Blocks Counterparts (assembled)



Note: *Check the package content corresponds to the above list.*
Please check the box and each single item inside has no defect. In case claims to the shipping company and communicates quickly to the assistant technical service or to the Customer service of Power-One.

C. User interface and use of the display

The system features a 2x16 character display, four buttons for navigating menus, and three LEDs to indicate device status.

Using the display and the buttons on the front panel it is possible to perform the initial configuration of the system (check of parameter acquisition from inverter, analog input configuration, and configuration of LAN network parameters).

For displaying the detailed parameters of the inverters and/or of the string-combs, as well as for the advanced configurations it is necessary to access the internal web server following the procedure described in paragraph "L".

A list of functions accessible from the display is shown in the table in Appendix 3.

USE OF BUTTONS	
	'Enter' button. Used to confirm an action, to access the main menu or the sub-menu corresponding to the selected entry (indicated by the > symbol), or to go to the next digit to change.
	'Down' button. Used to scroll down through the menu items, or to scroll the numerical scale in descending order.
	'Up' button. Used to scroll up through the menu items, or to scroll the numerical scale in ascending order.
	'Esc' button. Used to return to the previous menu or to return to the previous digit to change.

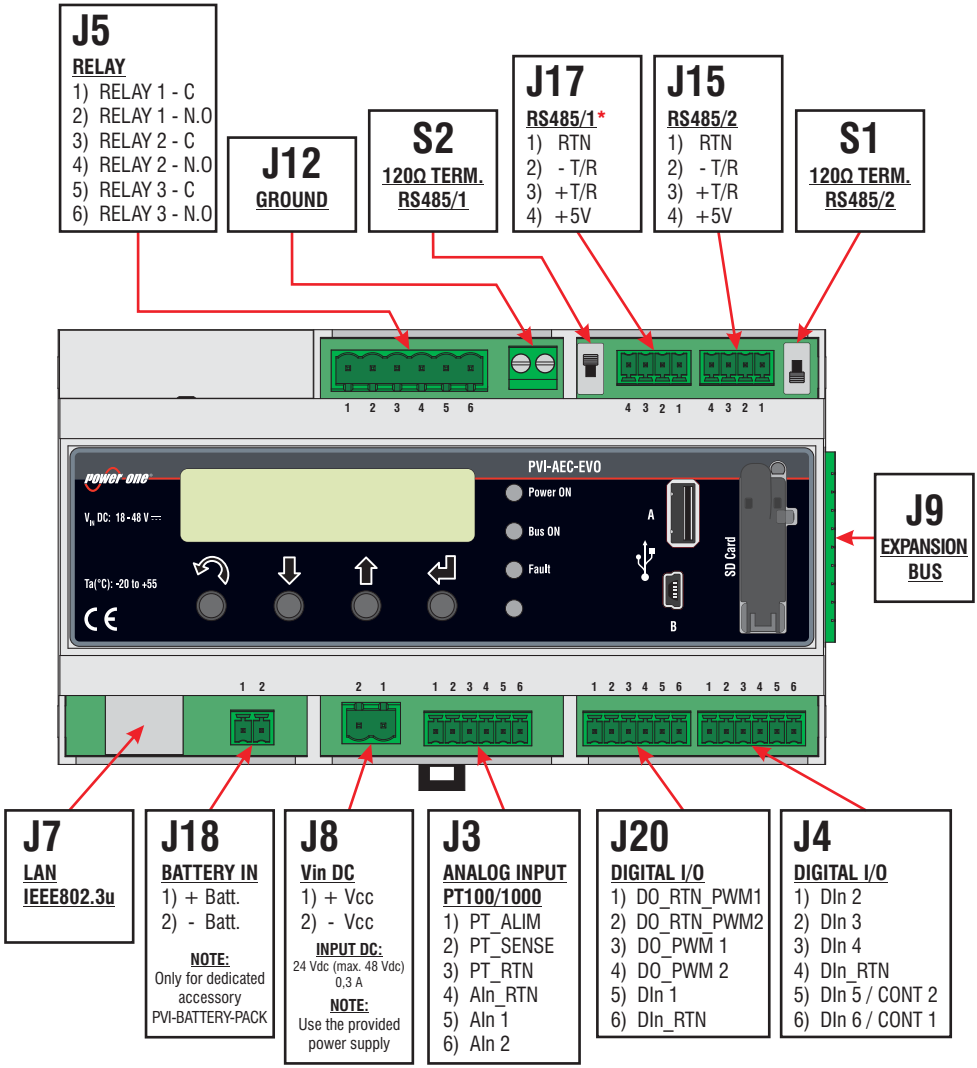
Access to the main menu with administrator privileges

To perform the initial configuration it is necessary to access the various display menus as administrator.

Press the 'ENTER' key ( ) and insert password **0010**: To insert the password press the arrow keys ( ) to change the value and the 'ENTER' key to confirm the value. This password gives access to all the display setting sub-menus of the system.

D. Pin-Out of System Connectors

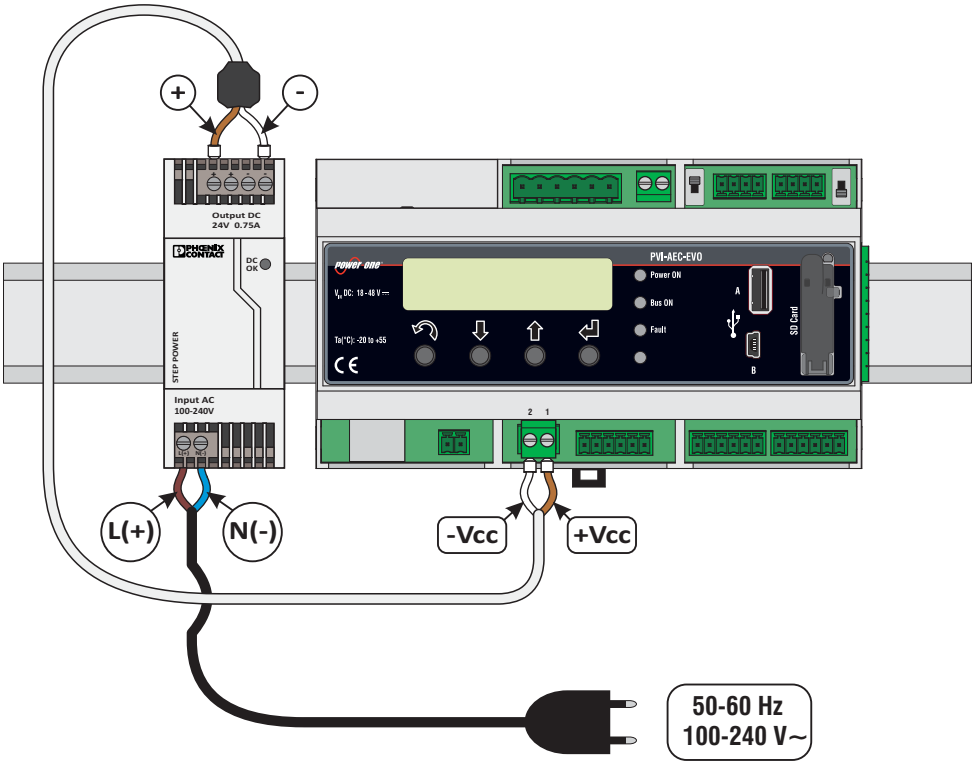
The diagram below shows the pin-out of the connectors which allow the system connection.



* In the PVI-AEC-EVO LIGHT model the RS458/1 port (J17) is not available as inverter communication port, but can be used only to acquire parameters from ISKRAEMECO power meters equipped with Modbus communication interface.

E. Power Supply Connections and System Start Up

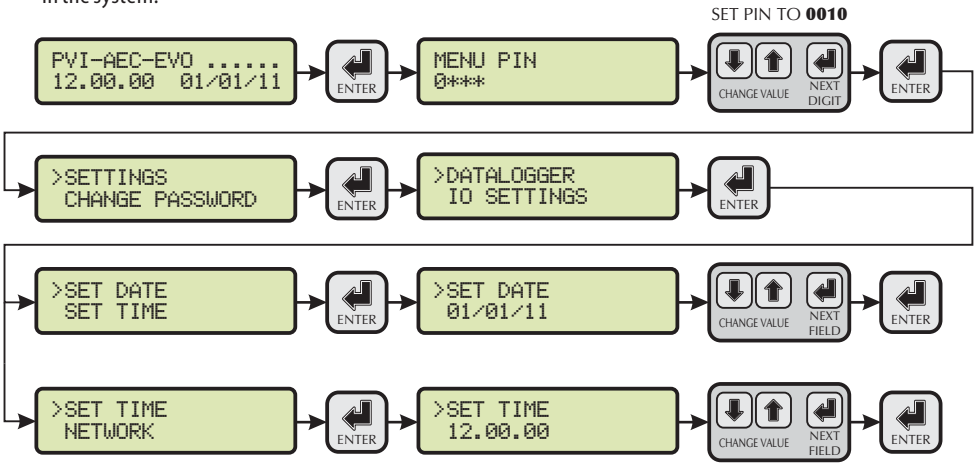
1. Connect the power supply to the power supply network (100/240V 50/60Hz): the "Power" led on the power supply will light up steadily. Check that the output voltage of the power supply is 24Vdc. Disconnect the power supply from the power supply network.
2. Connect the output of the power supply to the power supply terminal block of the PVI-AEC-EVO respecting the polarity and using the wiring provided.
3. Connect the power supply to the power supply network: After a first starting phase (lasting about 30 seconds) during which the system is not able to receive any input from the user, the green "PowerOn" led will remain lit. The message "PVI-AEC-EVO...." (in the first of the two lines) and date/time (in the second of the two lines) will be displayed.



Note: *The system must be supplied ONLY with power supply and wiring provided; otherwise the CE conformity will not be longer valid.*

F. Date and time settings

1. Enter the main menu as administrator (See par.'C').
2. Access the menu *'SETTINGS'* > *'DATALOGGER'* and then select the *'SET DATE'* sub-menu. This enables to set the correct date in the system.
3. Return to the menu *'DATALOGGER'* and then select the *'SET TIME'* sub-menu. This enables to set the correct time in the system.



G. Connection of the RS485 line and inverter acquisition check

The connection of the RS485 line must be carried out respecting the pin-outs of the J15 and/or J17 connectors.

> **Note:** *For PVI-AEC-EVO LIGHT, the only usable RS485 port for inverter monitoring is the RS485/2, correspondent to connector J15.*

t is recommended to connect the RS485 line when all the equipment is switched off (both the monitoring system and the inverters) and to start up the monitoring system first and then the inverters. It is recommended to:

- Use a cable for RS485 applications with the following characteristics: 1 twisted pair + 1 conductor or two twisted pairs, Screen and characteristic Impedance equal to 120Ω. For further information on the cable to be used refer to Appendix 2.
- Make sure the signals correspond.
- Make sure that all three lines (+T/R, -T/R and RTN) are connected according to the diagrams in pages 9 - 10.
- Make sure that the communication line screen is grounded according to the diagrams in pages 9 - 10).
- Make sure that each element in the chain (each inverter or each 55kW module) has a RS485 address that is different from the others.This address can be set via the display of the inverter.

Note: *For PVI-AEC-EVO LIGHT, the inverters must be set with addresses: 1, 2, 3, 4, 5. The configuration of address 1 corresponds to "AUTO" settings as inverter address.*

Note: *When connecting multiple units (string inverter or/and 55kW conversion modules) it is necessary to wire the RS485 communication line according to the daisy-chain diagram (enter-exit).*

The last inverter of the daisy-chain must be 'terminated' by activating the termination resistance of the 120Ω communication line through switching the dip-switch located on the motherboard in the string inverters, and inside each framework of the central inverters.

Note: *The maximum number of units (string inverters or/and 55kW conversion modules) that can be connected to a RS485 port of the PVI-AEC-EVO is 62. In order to connect a number of units greater than 62 it is necessary to use the second RS485/2 port respecting the same wiring diagram used for the main RS485/1 port.*

In the PVI-AEC-EVO LIGHT the number of inverters that can be acquired is limited to a maximum of 5 strings inverters which can be connected by RS485/2 (Ref. Par. D). Compatible models (in every their variation) for the PVI-ACE-EVO LIGHT version are: PVI-2000(-OUTD); UNO-2.0/2.5-I-OUTD; PVI-3600; PVI-3.0/3.6/4.2-TL-OUTD; PVI-3.8/4.6-I-OUTD; PVI-5000/6000-TL-OUTD; PVI-10.0/12.5-TL-OUTD; PVI-10.0/12.0-I-OUTD.

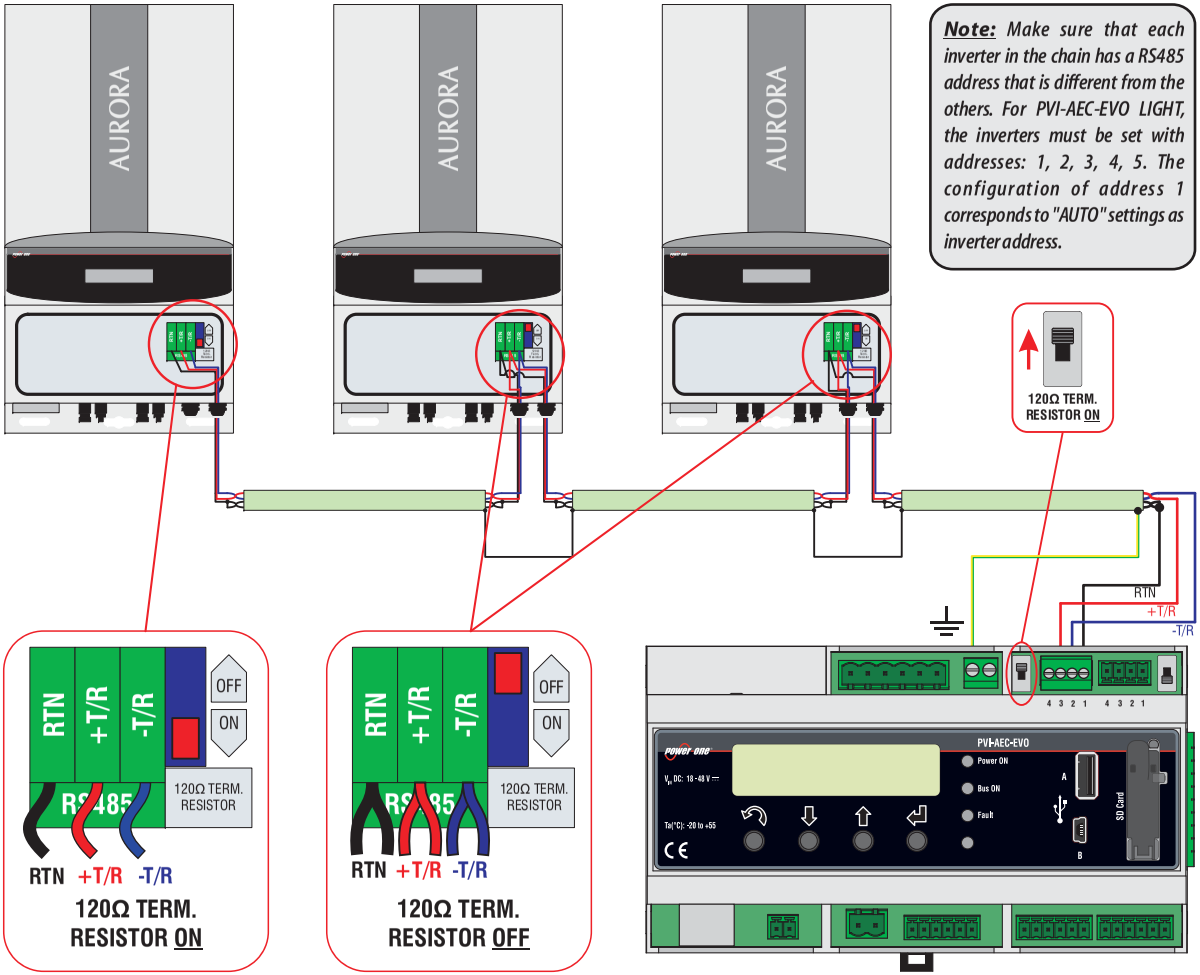
Note: *In case of mixed systems, the presence of both string inverters and central inverters on the same RS485 line is permitted. To wire this line follow all the directions above.*

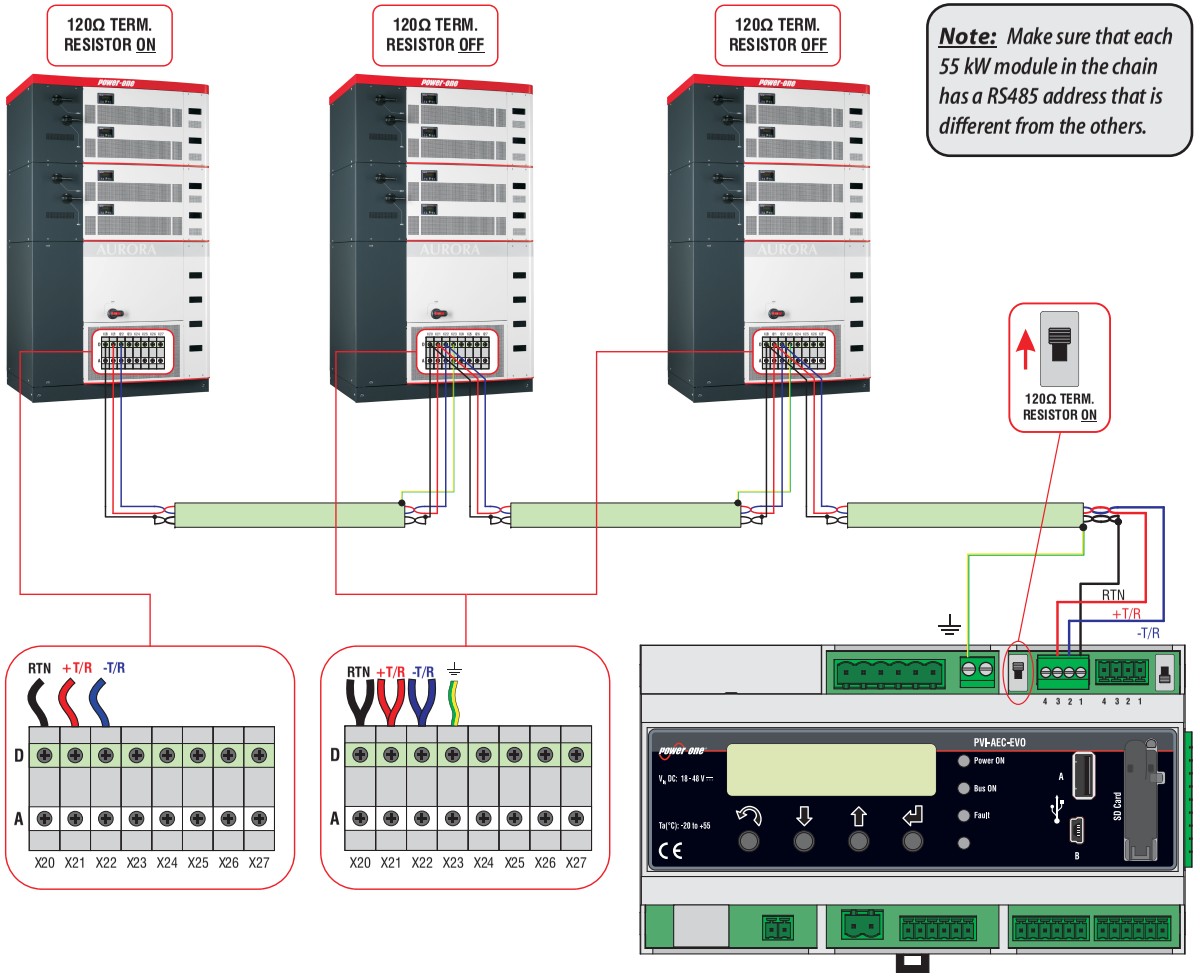
Note: *All string inverters (except for models PVI-5000/6000-TL-OUTD) have a clamp that allows giving continuity to the cable shield of the RS485 line.*

For single-phase inverters this clamp is indicated by the words LNK, for three-phase inverters it is indicated by SCLD.

Note: *The centralized inverters have a clamp, which is located in the signal terminal block and marked with "X23", that allows to link to ground the shield of each singular portion of the communication line independently from the other portion of communication line. (must not be given continuity to the cable shield).*

Note: *For further details on the wiring of the RS485 line and/or the activation of the termination resistances, refer to the user manual of string inverters and to the user manual of central inverters.*

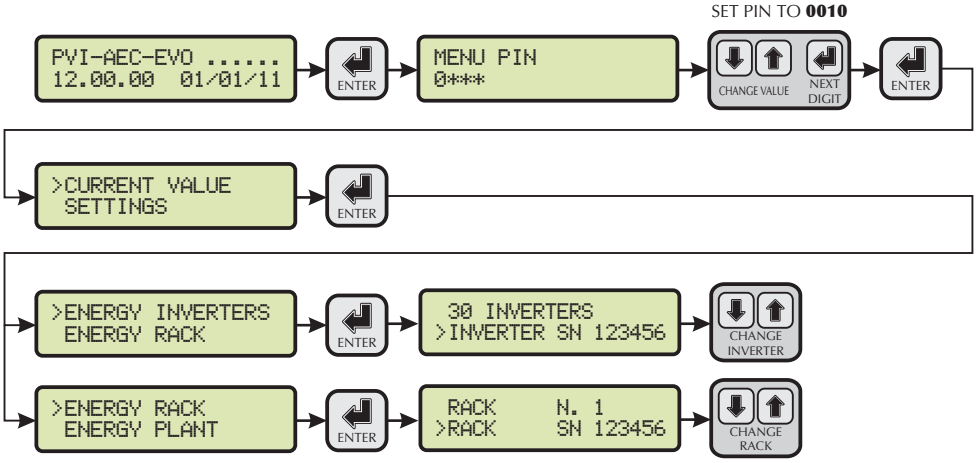

AURORA
AURORA
AURORA
Note: Make sure that each inverter in the chain has a RS485 address that is different from the others. For PVI-AEC-EVO LIGHT, the inverters must be set with addresses: 1, 2, 3, 4, 5. The configuration of address 1 corresponds to "AUTO" settings as inverter address.
120Ω TERM. RESISTOR ON
RTN
+T/R
-T/R
OFF
ON
120Ω TERM. RESISTOR
RTN +T/R -T/R
120Ω TERM. RESISTOR ON
120Ω TERM. RESISTOR OFF
PVI-AEC-EVO
Power ON
Bus ON
Fault
SD Card
4 3 2 1
4 3 2 1



Note: *Make sure that each 55 kW module in the chain has a RS485 address that is different from the others.*

After carrying out these checks, start up first the monitoring system and then the inverters. The system automatically carries out a scan of the RS485 bus and automatically detects the available inverters. The presence of the inverters can be checked directly from the display.

1. Enter the main menu as administrator (See par.'C').
2. Access the *'CURRENT VALUES' > 'ENERGY INVERTERS'* menu (to display the string inverters) and/or *'CURRENT VALUES' > 'ENERGY RACK'* (to display the 55kW conversion modules). The number of inverters detected during the scan will be displayed; the list of the monitored inverters identified by the Serial Number (S/N) can be displayed by scrolling using the arrow keys (⬇ ⬆).



Note: *The time necessary for the PVI-AEC-EVO to scan and acquire the inverters depends on the number of inverters present on the same line (sometimes several minutes).*

H. Configuration of the Analog Inputs

The connection of the analogue sensors must be carried out respecting the pin-outs of the J3 connector.
The system has two 0-10 Vdc inputs and a PT100/1000 input.

Note: *To each analogue input (both 0-10 Vdc and PT100/1000 types) it is possible to connect only one analog sensor. It is therefore not possible to connect multiple sensors on the same analog input.*

With respect to the connection of the PT100/1000 sensors, the system is able to carry out the sensor reading through the connection of three-wires:

- A sensor power supply line (PT_ALIM);
- A reading line (PT_SENSE);
- A power supply and reading closing line (PT_RTN).

The measurement is carried out between PT_SENSE and PT_RTN, therefore the element to be measured must be wired between these two signals.

The PT100/PT1000 sensor is automatically recognised by the system and is therefore acquired without the need for further settings.

Regarding the connection of the sensors with output range 0...10Vdc, these must be powered and the power supply can be taken directly from the system power supply; the grounding of the power supply and the grounding of the signal reading is the same.

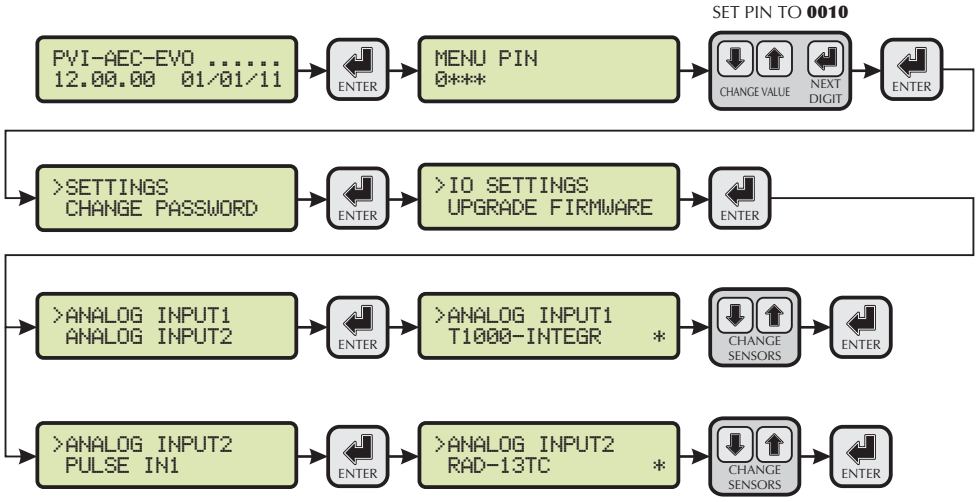
For the sensor connection, beside the power supply, it is necessary to connect the signal proportionally to the quantity measured at one of the two analog inputs available (AIn1/AIn2).

The grounding of the signal to be measured (if different from the grounding of the power supply – within the Power-One sensor range only in the wind speed sensor PVI-AEC-WIND-COMPACT) must be connected to the AIn_RTN clamp.

After carrying out the connections it is necessary to configure the sensor in the system so that the correct quantity is acquired:

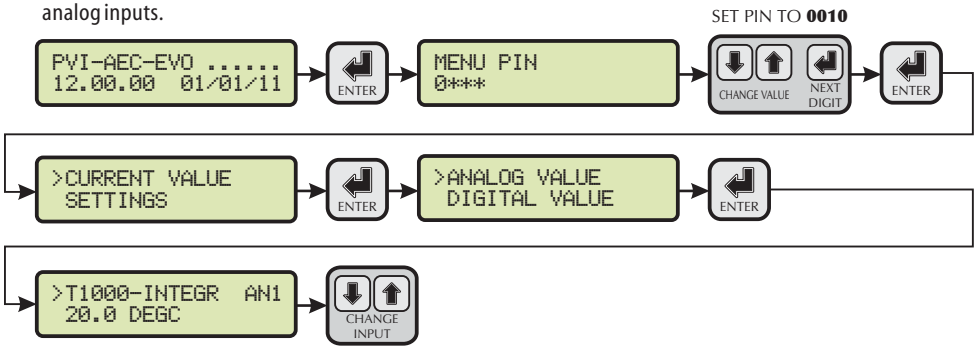
1. Enter the main menu as administrator (See par.'C').
2. Access the menu *'SETTINGS' > 'IO SETTINGS'*.
3. Select the *"ANALOG INPUT1"* item and then select the sensor model connected to the AIn1 input of the system (the selected model will be identified with an asterisk (*)).
4. Select the *"ANALOG INPUT2"* item and then select the sensor model connected to the AIn2 input of the system (the selected model will be identified with an asterisk (*)).

> **Note:** *In case of connecting PT100/1000 sensors with only two terminals, connect a terminal to the PT_SENSE clamp and a terminal to the PT_RTN clamp, then make a jumper between PT_ALIM and PT_SENSE.*



To read the measurements of the sensors and to check their accuracy follow the instructions below:

1. Enter the main menu as administrator (See par.'C').
2. Access the menu *'CURRENT VALUES' > 'ANALOG VALUE'*. The quantity value will be displayed for each of the analog inputs.



Note: *In the following table it is reported a list of the sensor which are present in the catalogue "Power-one". For the connection of these sensors, please make reference to diagrams shown in Appendix 1.*

SENSORS WITH ANALOG OUTPUTS COMPATIBLE WITH PVI-AEC-EVO (POWER-ONE CATALOGUE)

MODELL	TYPE	DISPLAY IDENTIFICATION CODE	OPERATIVE RANGE
PVI-AEC-IRR	Radiation sensor (W/m^2 --> V)	IRR	0-1200 W/m^2
PVI-AEC-IRR-T	Radiation sensor with integrated cell temperature sensor (W/m^2 / °C --> V)	IRR-T_Irr / IRR-T_Temp	0-1200 W/m^2 -20 to +80 °C
PVI-AEC-RAD-13TC	Radiation sensor (W/m^2 --> V)	RAD-13TC	0-1300 W/m^2
PVI-AEC-RAD-13TC-T	Radiation sensor with integrated cell temperature sensor (W/m^2 / °C --> V)	RAD-13-TC-T_Irr / RAD-13-TC-T_Temp	0-1300 W/m^2 -25 to +90 °C
PVI-AEC-T100-ADH	Adhesive module temperature sensor (back cell) PT100	T100-ADH	-50 to +150 °C
PVI-AEC-T1000-INTEGR	Ambient temperature sensor connected to PT100/0...10Vdc converter (°C --> V)	T1000-INTEGR	-50 to +50 °C
PVI-AEC-T1000-BOX	Ambient temperature sensor PT100	T1000-BOX	-50 to +50 °C
PVI-AEC-PYR-1300	Pyranometer (W/m^2 --> V)	Pirano_0-20mA	0-1300 W/m^2
PVI-AEC-WIND-COMPACT	Wind speed sensor (m/s --> V)	WIND-COMPACT	0 - 50 m/s
PVI-AEC-WIND-DIR	Wind direction sensor (° --> V)	WIND-DIR	0 - 360°

Note: *The system is predisposed for the connection to other sensors available: ZippZonen Pyranometer 0-1600W/m^2 and Pyranometer 0-2000W/m^2.*

I. System Configuration for connection to the LAN Network (Ethernet Port)

The connection to the PC of PVI-AEC-EVO can be made through direct connection via Ethernet cable, or connecting both devices to a local network LAN (via router, hub or switch).

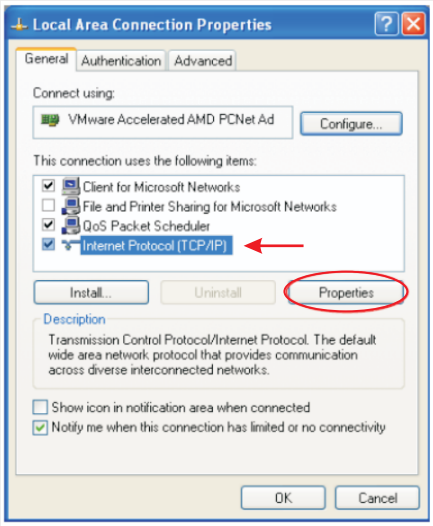
In case of direct connection, it is enough to connect the two devices between them through a Ethernet cable and set the network parameters of PVI-AEC-EVO and of the PC to make sure they are compatible between them.

> ***Note:*** *The IP address of the PC and the IP address of the PVI-AEC-EVO must belong to the same group but they must not be identical, for instance:*
>
> *PC IP ADDRESS: 20.200.200.**1***
>
> *PVI-AEC-EVO IP ADDRESS: 20.200.200.**24***
>
> *The subnet mask must be the same for both devices, for instance: 255.0.0.0*

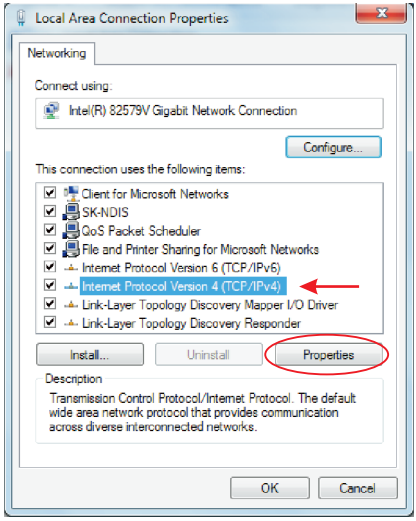
In case of connection to a pre-existing local network LAN, it is necessary to assign to PVI-AEC-EVO the network parameters which have to be compatible with the local network to which the PVI-AEC-EVO is connected. Make reference to the network administrator to obtain the correct parameters of the network.

CHANGE OF PC NETWORK PARAMETERS

In order to change pc network parameters, please select ***"Start"*** and then ***"Control Panel"***, click on ***"Network Connections"***: the new window will show the network connections; with the right button of your mouse click on ***"Local Area Connection"*** and select ***"Properties"***; as shown in the following figure.

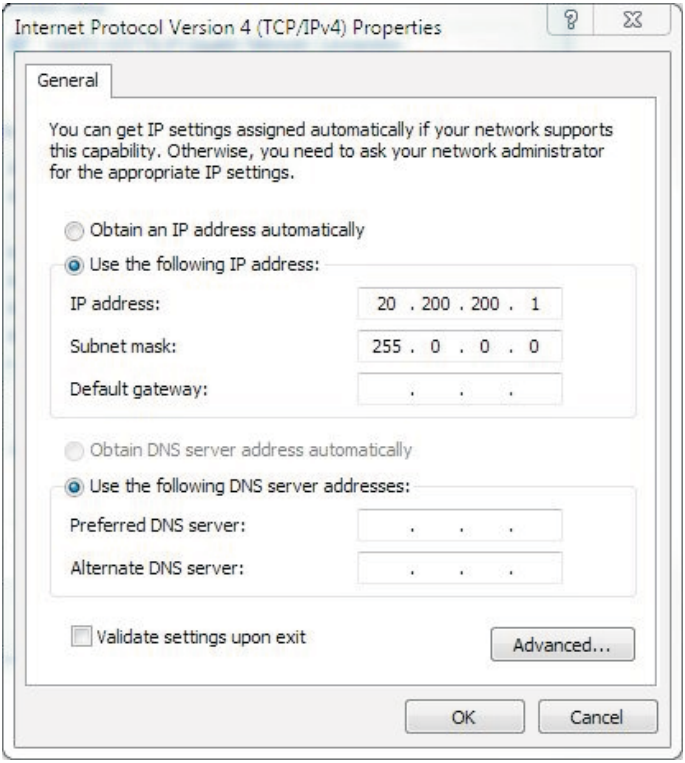


Windows XP



Windows 7

Select ***"Internet Protocol (TCP/IP)"*** (or ***"Internet Protocol Version 4 (TCP/IPv4)"*** in Windows 7) and click on ***"Properties"***.


Internet Protocol Version 4 (TCP/IPv4) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
20 . 200 . 200 . 1
Subnet mask:
255 . 0 . 0 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Validate settings upon exit
Advanced...
OK
Cancel

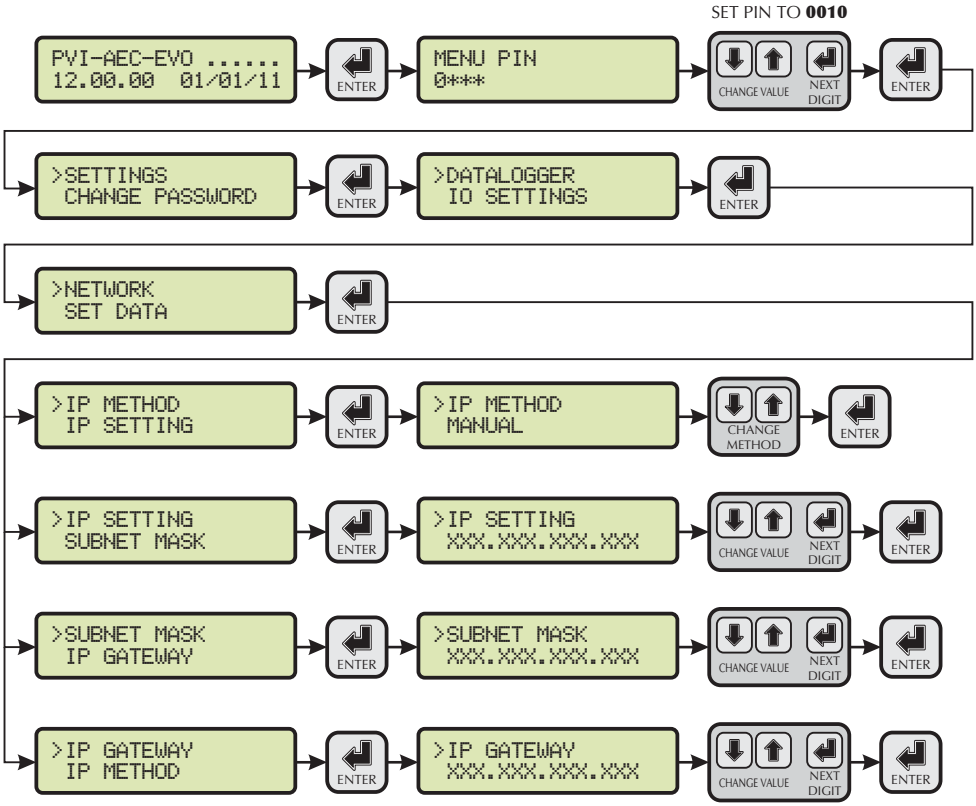
Select the option *"Use the following IP address"* and insert the network parameters (IP address, Subnet Mask, Gateway) compatible with the network parameters set in the PVI-AEC-EVO.
DNS parameters fields can be let empty.

Note: *In case of direct connection between PVI-AEC-EVO and PC we suggest not to set "Gateway" parameters.*

CHANGE THE PVI-AEC-EVO NETWORK PARAMETERS

:in order to change the PVI-AEC-EVO network parameters, please follow the procedure below:

1. Power on the system and wait for the start up phase to complete (Ref. Par. 'E').
2. Enter the main menu as administrator (Ref. Par. 'C').
3. Access the menu *"SETTINGS"* > *"NETWORK"*. The parameters for connection to the LAN network (IP address, Subnet mask, Gateway) may be modified using the items of the *"NETWORK"* menu. This allows to configure the system for connection to the LAN network and/or for direct connection to a PC.
4. At the end of the setting operations, return to the main screen, then switch off and switch on the system to make the settings take effect.



L. Internal Webserver access

In order to access to the Webserver pages of the system, after having done the connection of the system to the local network LAN or direct connection to the PC, open an internet browser (e.g. Internet Explorer) and type into the address bar the following address: *http://<system IP address>*

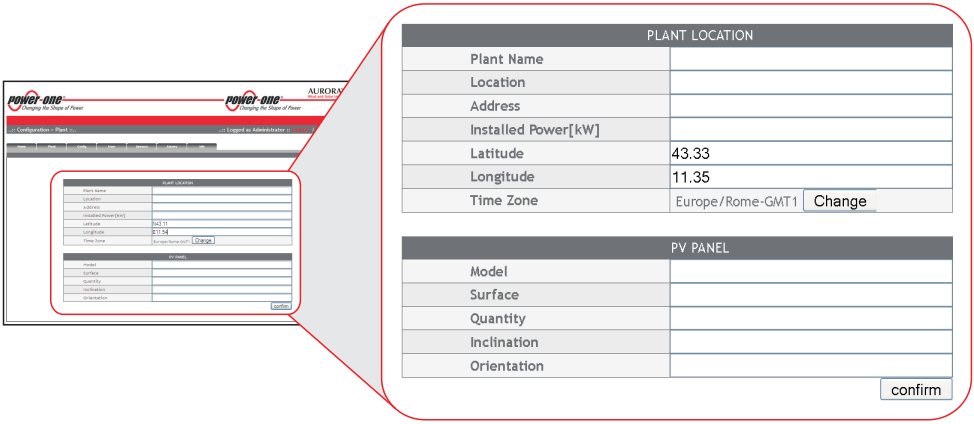
Note: *To access the webserver pages it is necessary to insert a username and a password:*
USERNAME: admin PASSWORD: admin

After having done the access to the internal Webserver, go to the configuration page (CONFIG) of the system (PLANT) and insert the installation GPS coordinates according to one of the following formats:

		Indicator	Degrees	Point	Degrees (Hundredths of degree)
Latitude	*N43.33*	N	43	.	33
Longitude	*E11.35*	E	11	.	35

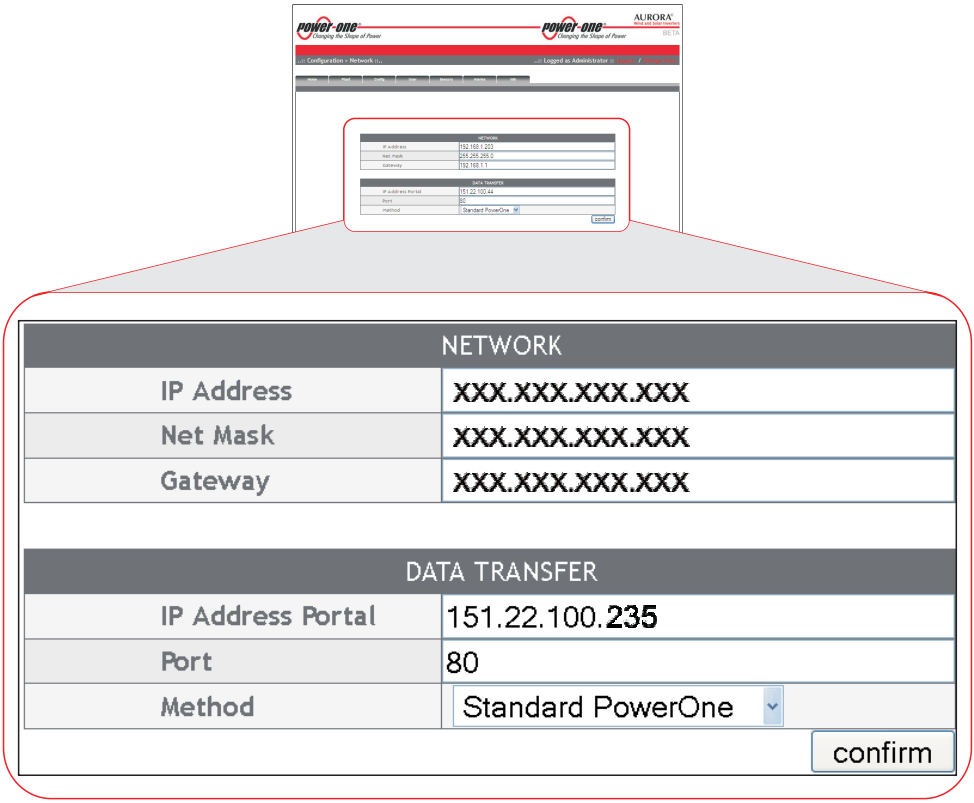
		Degrees	Indicator	Minutes	Quotation Mark	Seconds	Double quotation mark*
Latitude	*43N50'20"*	43	N	50	'	20	"
Longitude	*11E23'30"*	11	E	23	'	30	"

* The Double Quotation Mark (") symbol must be inserted by entering twice the quotation mark (') symbol.



Note: *To set the GPS parameter is mandatory to assure the proper working of monitoring system.*

In order to allow the PVI-AEC-EVO to communicate with the Power-One Web Portal, access the configuration page (CONFIG) of the network (NETWORK) and check that in section 'DATA TRANSFER', under item 'IP Address Portal' there is the IP address ***151.22.100.235***.



NETWORK	
IP Address	XXX.XXX.XXX.XXX
Net Mask	XXX.XXX.XXX.XXX
Gateway	XXX.XXX.XXX.XXX

DATA TRANSFER	
IP Address Portal	151.22.100.235
Port	80
Method	Standard PowerOne

confirm

Note: *If the setting 'IP Portal Address' does not correspond to 151.22.100.235, change it by entering the above-mentioned address and press 'Confirm' to activate it. After this operation, reset the system (ON-OFF).*

Note: *To make the system fully functioning it is essential that the same system is constantly connected to the internet so that it is able to communicate with the Power-One server. This is essential to graphically shows the data on web pages as well as for sending alarm and/or report messages.It is essential that the LAN network in which the PVI-AEC-EVO is wired is such that it allows the connection to the IP address 151.22.100.235 to be reached through port 80, so that the PVI-AEC-EVO is able to communicate with the portal management server.*

M. Request Form for a New System on Web Portal

Associate an already existing user account with this system?	☐ YES ☐ NO
Name and Surname *(for the display of the contact)*	.....
Username *(to access the portal)*	.....
Password *(to access the portal – at least 8 characters)*	....
E-Mail *(to send alarm and/or report messages according to the customized configuration set by the user)*	....
S/N of the PVI-AEC-EVO *(The S/N can be read on the system identification label or on the display (refer to par. "N"))*	....
System Name *(for the creation of the system linked to the PVI-AEC-EVO(s))*	....
System Location *(requested for setting the GPS coordinates – enter also the latitude and longitude of the system, if available)*	..... LAT: ..... LONG: .....

SEND THIS FORM TO THE E-MAIL ADDRESS:

service.uk@power-one.com

Notes:

- *The form must be sent ONLY AFTER establishing the connection to the Internet of the PVI-AEC-EVO.*
- *You can enter a single email address that will receive the warning messages and/or reports messages.*
- *System S/N is mandatory to proceed with webportal activation.*
- *If you would like to request the activation of a portal linked to a number of data loggers installed in various systems, you are requested to fill in a form for each system.*
- *The new account that will be created shall have administrator privileges on the system associated with it.*
- *With the administrator account you can modify the portal settings and create further accounts with user credentials.*
- *With the user account you can only display the system data.*
- *To access the portal you need to connect to the website:*

  http://auroraonline.power-one.it

  and to use the credentials indicated in the table above.

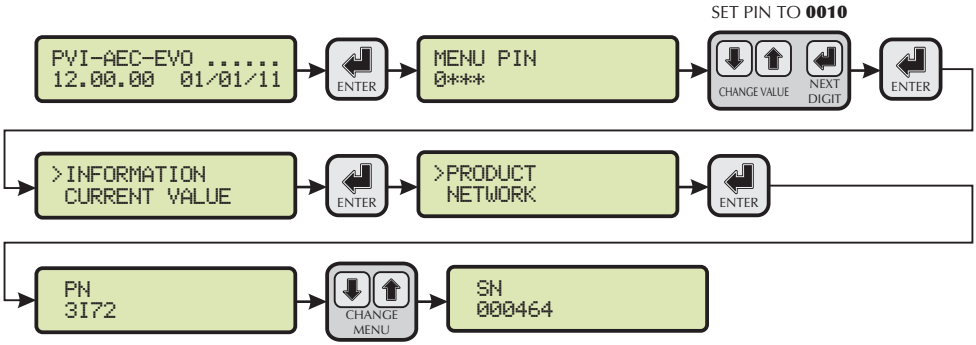
N. Serial Number (S/N) Identification

To complete the registration to the Web Portal using the form included in paragraph "M" is necessary to enter the Serial Number (S / N) of PVI-AEC-EVO present in plant.

It is possible to obtain the Serial Number of your PVI-AEC-EVO observing the label on the right side of the product. The Serial Number consists of 6 decimal places shown in red in the example figure below.

Alternatively it's possible to obtain the S/N from the display:

1. Enter the main menu as ADMINISTRATOR (refer to par. "C")
2. Enter the *"INFORMATION"* > *"PRODUCT"* menu.
3. Using the arrow buttons (⬇ ⬆) move to *"SN"* view.



O. Firmware update via Web Portal

The firmware of the PVI-AEC-EVO can be updated via the Web Portal.

Each time a new firmware version is available, a warning will appear on the Web Portal pages indicating that a new firmware is available. Moreover, users associated with the system will receive an e-mail notification.

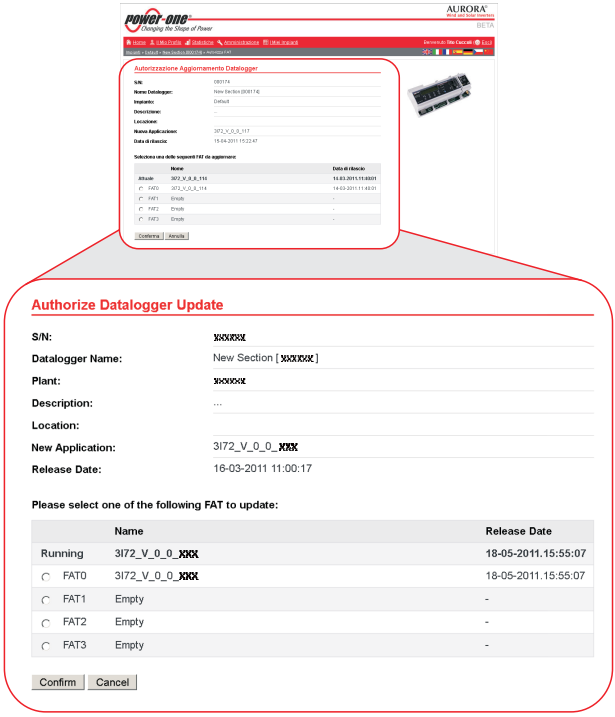
To upgrade the firmware it is necessary to click on the link in the alert or on the link in the e-mail notification.

This will open a page where authorization is requested in order to proceed with the firmware update, and where the location of memory (FAT) where to install the new firmware will be requested.

The maximum number of firmware versions that the memory can keep is 4 (FAT0, FAT1, FAT2, FAT3).

It is advisable to install the new version of the firmware into an empty memory location, or in the memory location containing the oldest version of the firmware.

After selecting the desired memory location, click on 'Confirm' to proceed with the installation.



P. Firmware updating procedure via SD Card

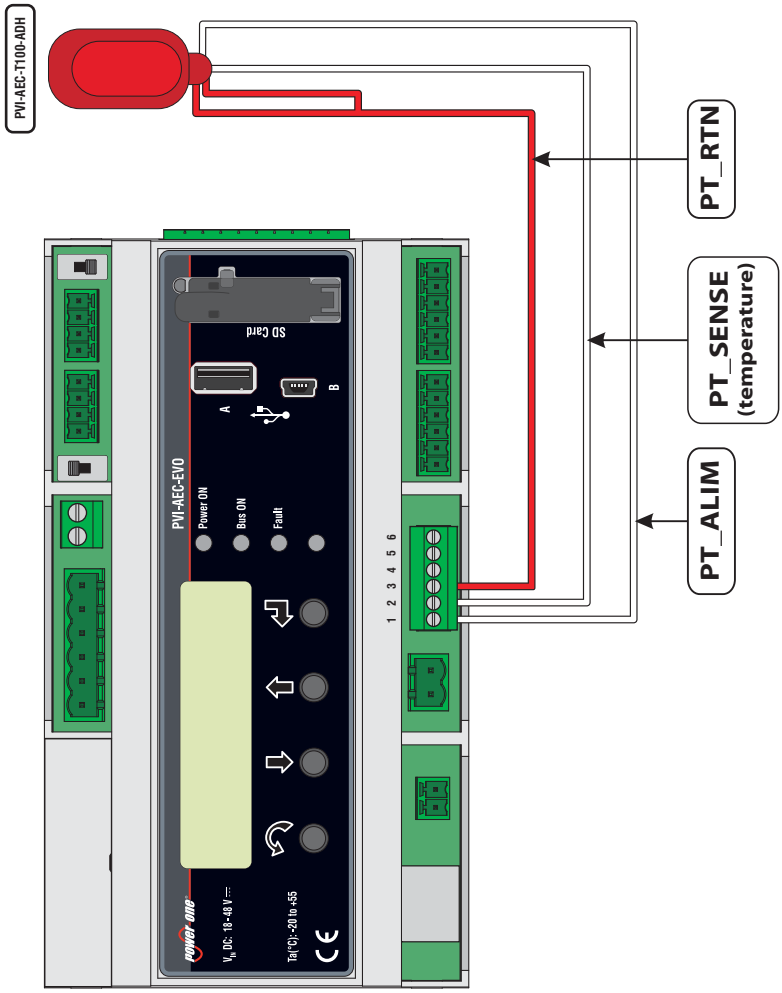
> **Note:** *The firmware update via SD card should be carried out only if it is not possible to update the firmware via the Web Portal.*

1. Access the display by entering the user password 0000.
2. Check and note the current firmware versions installed:

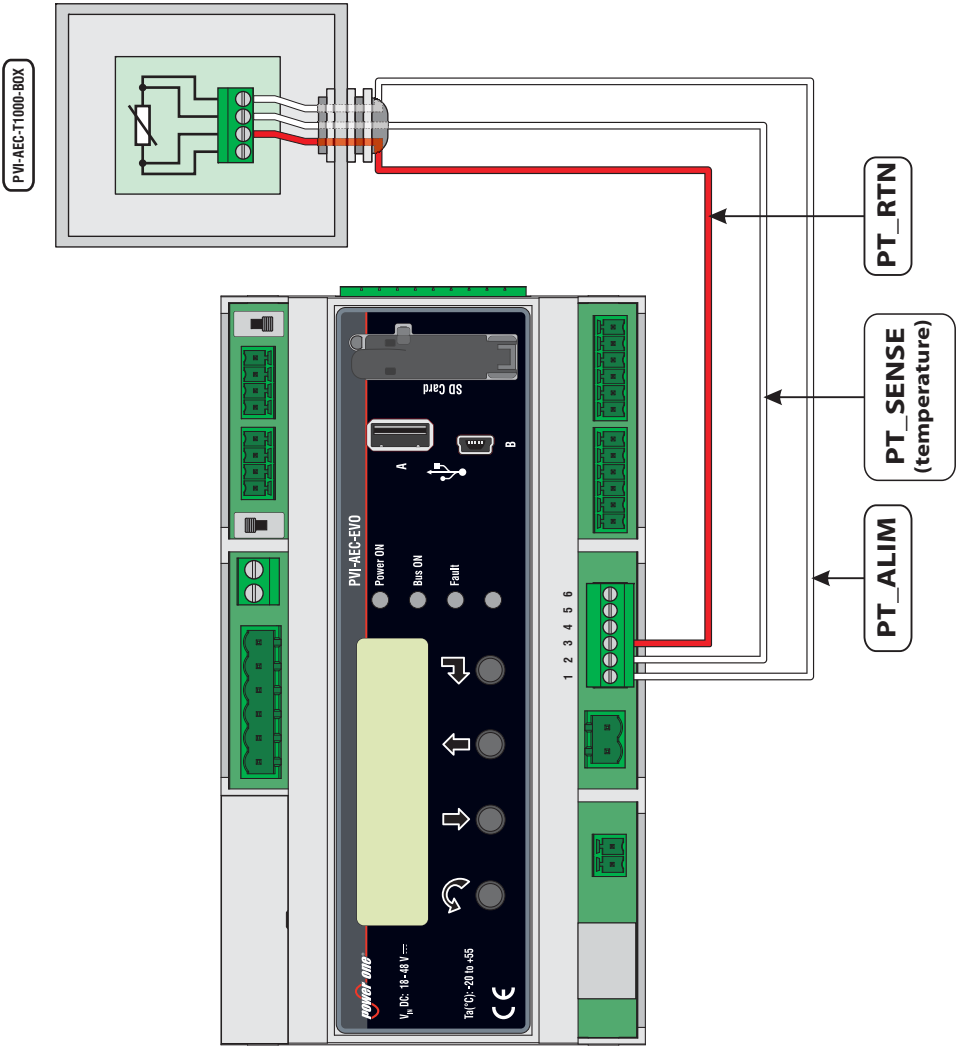
   Firmware AVR: *Information > Product > Firmware AVR*
   Firmware Display: *Information > Product > Firmware Display*
   Firmware IO: *Information > Product > Firmware IO*
3. Turn off the PVI-AEC-EVO and wait at least one minute.
4. Disconnect all available connections from the PVI-AEC-EVO (RS458 line(s), LAN connection, sensors).
5. Remove the SD Card from the slot on the PVI-AEC-EVO front panel by pressing the SD Card gently.
6. Insert the SD Card into the SD Card reader or into to the SD Card reader slot of the PC.
7. Delete the folders upgrade, web, lang and config from the SD Card.
8. Copy the new folders upgrade, web, lang and config into the root of the SD Card.
9. Remove the SD Card from the SD Card reader or from the SD Card reader slot.
10. Insert the SD Card into the slot on the PVI-AEC-EVO front panel by pressing the SD Card gently to lock it into place.
11. Turn on the PVI-AEC-EVO and wait about one minute. (N.B.: Power failure during update may cause serious damage to the device).
12. Enter the display by pushing the ENTER button and insert the password "0010"; push ENTER to confirm.
13. Follow the path: *"SETTINGS > UPGRADE FIRMWARE > UPGRADE AVR"* press ENTER to confirm; wait the completing of upgrade (few minutes). After the upgrade the system will reboot: wait the complete reboot (date/time will be shown on the display).
14. Enter the display by pushing the ENTER button and insert the password "0010"; push ENTER to confirm.
15. Follow the path *"SETTINGS > UPGRADE FIRMWARE > UPGRADE ADC"* press ENTER to confirm; wait the completing of upgrade (few minutes). The upgrading process will be completed when the message *"Upgrade Success"* will be displayed.
16. Follow the path *"SETTINGS > UPGRADE FIRMWARE > UPGRADE DISPLAY"* press ENTER to confirm; wait the completing of upgrade (few minutes). The upgrading process will be completed when the message *"Upgrade Success"* will be displayed.
17. Follow the path *"SETTINGS > UPGRADE CONFIG"* press ENTER to confirm; wait the completing of upgrade (few minutes). The upgrading process will be completed when the message *"UPGRADE CONFIG"* will be displayed again. Press ESC to exit.
18. Switch off the system, restore all connections (RS485 line(s), LAN connection, sensors), then switch on the system.

Appendix

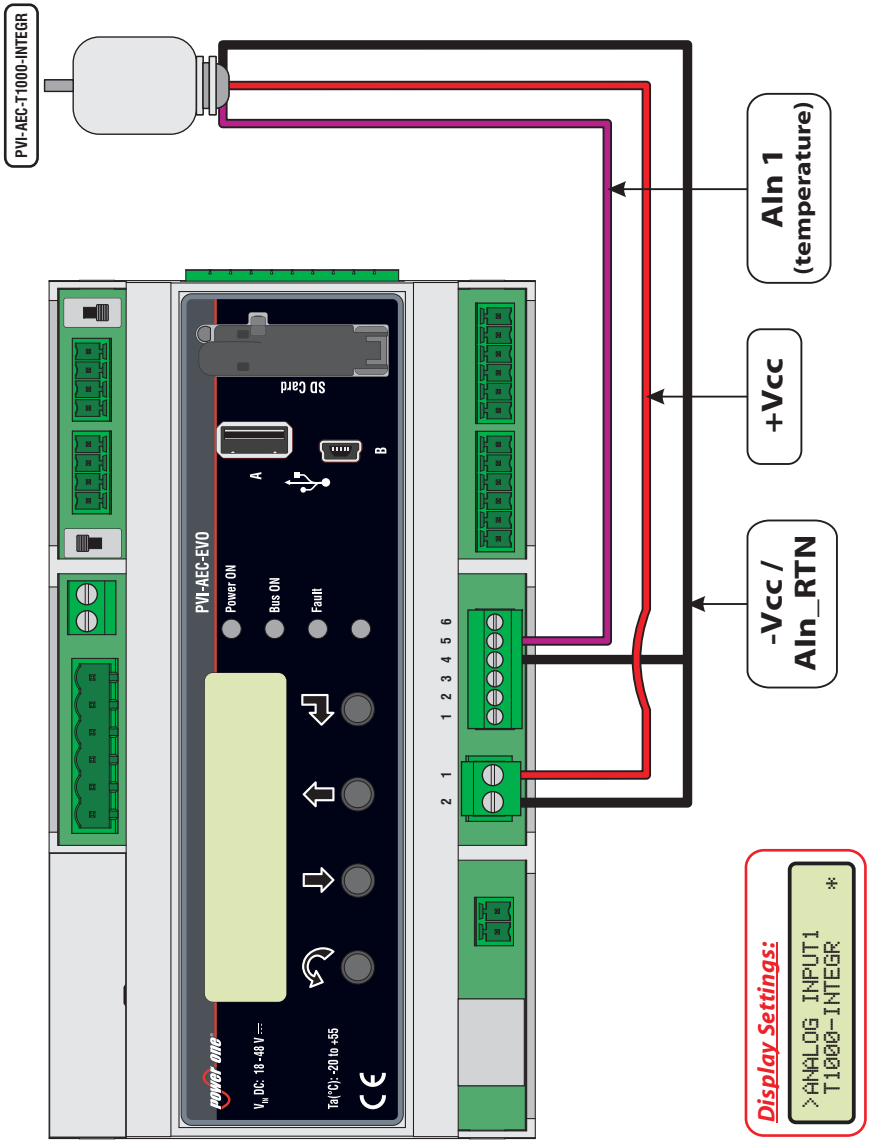
1. Wiring Diagrams for compatible sensors



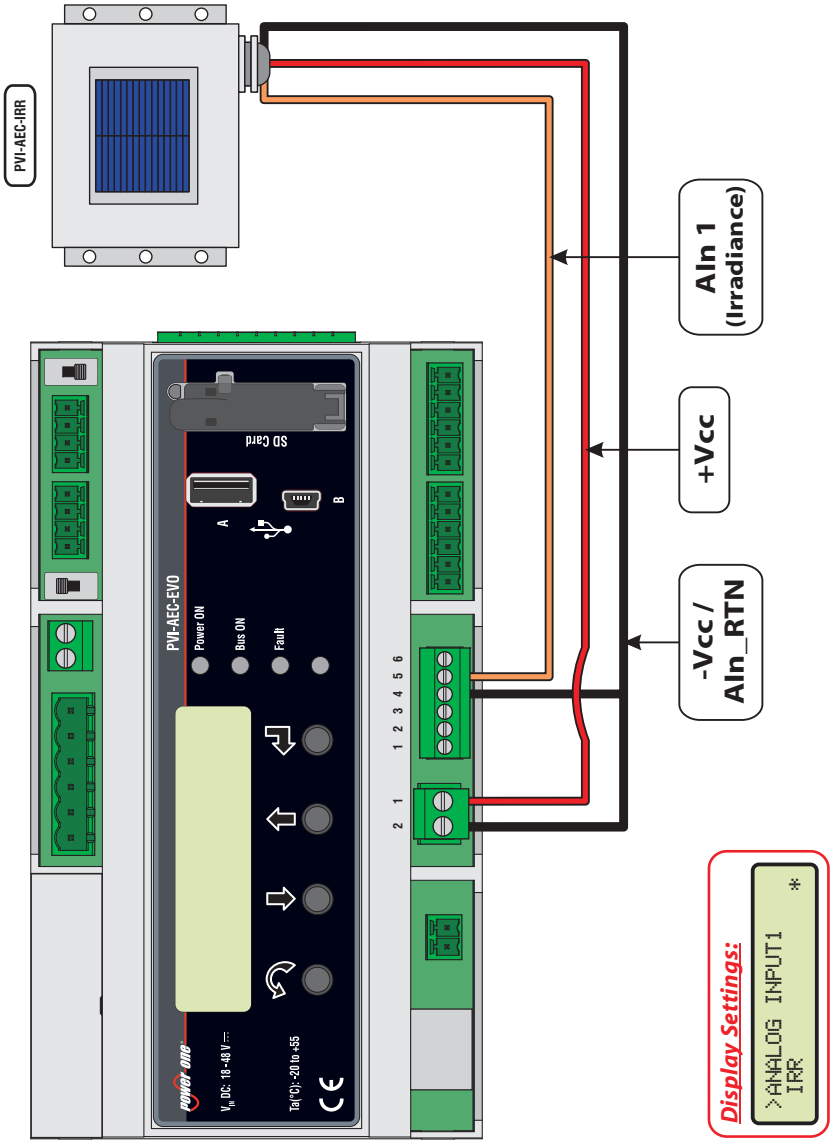
Wiring Diagrams for the Sensors PVI-AEC-T100-ADH



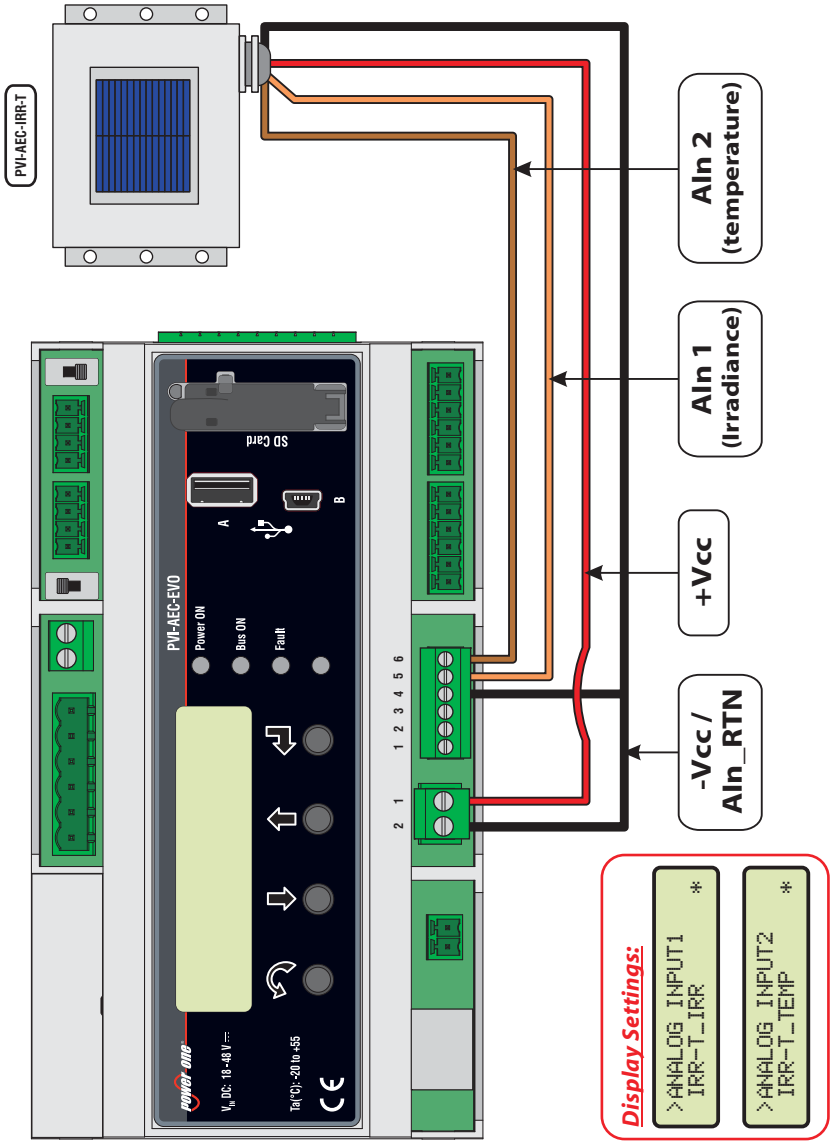
Wiring Diagrams for the Sensors PVI-AEC-T1000-BOX



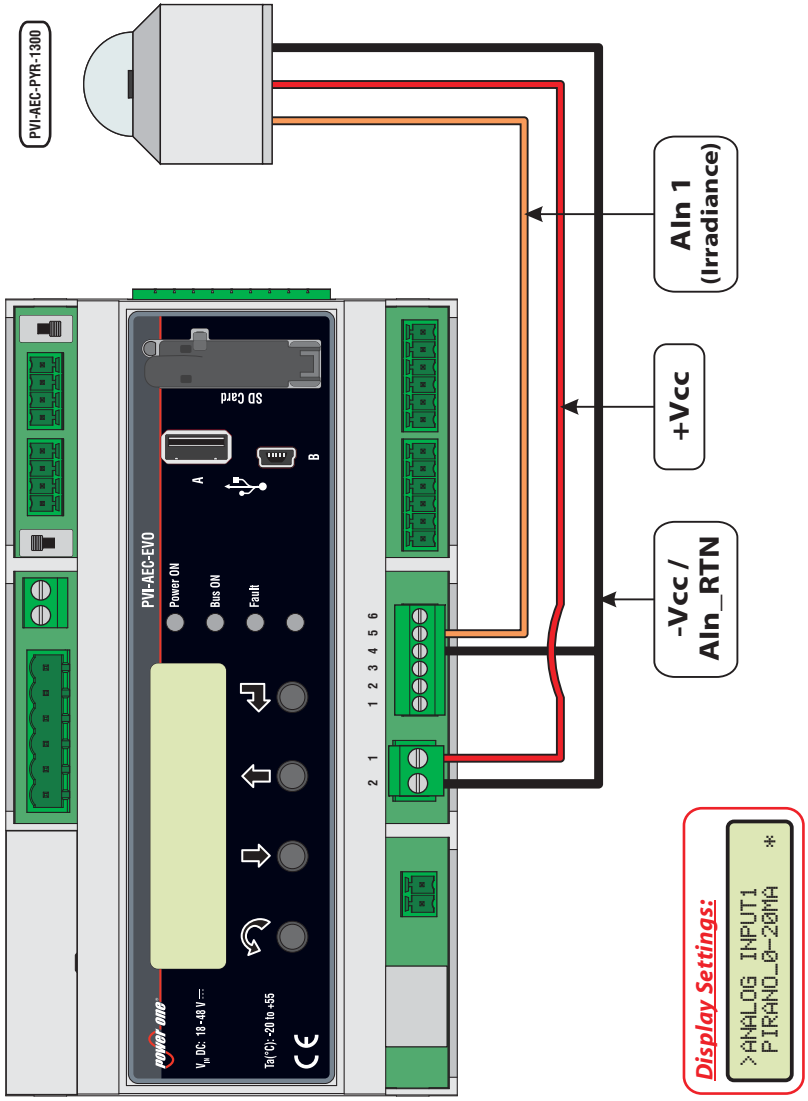
Wiring Diagrams for the Sensor PVI-AEC-T1000-INTEGR



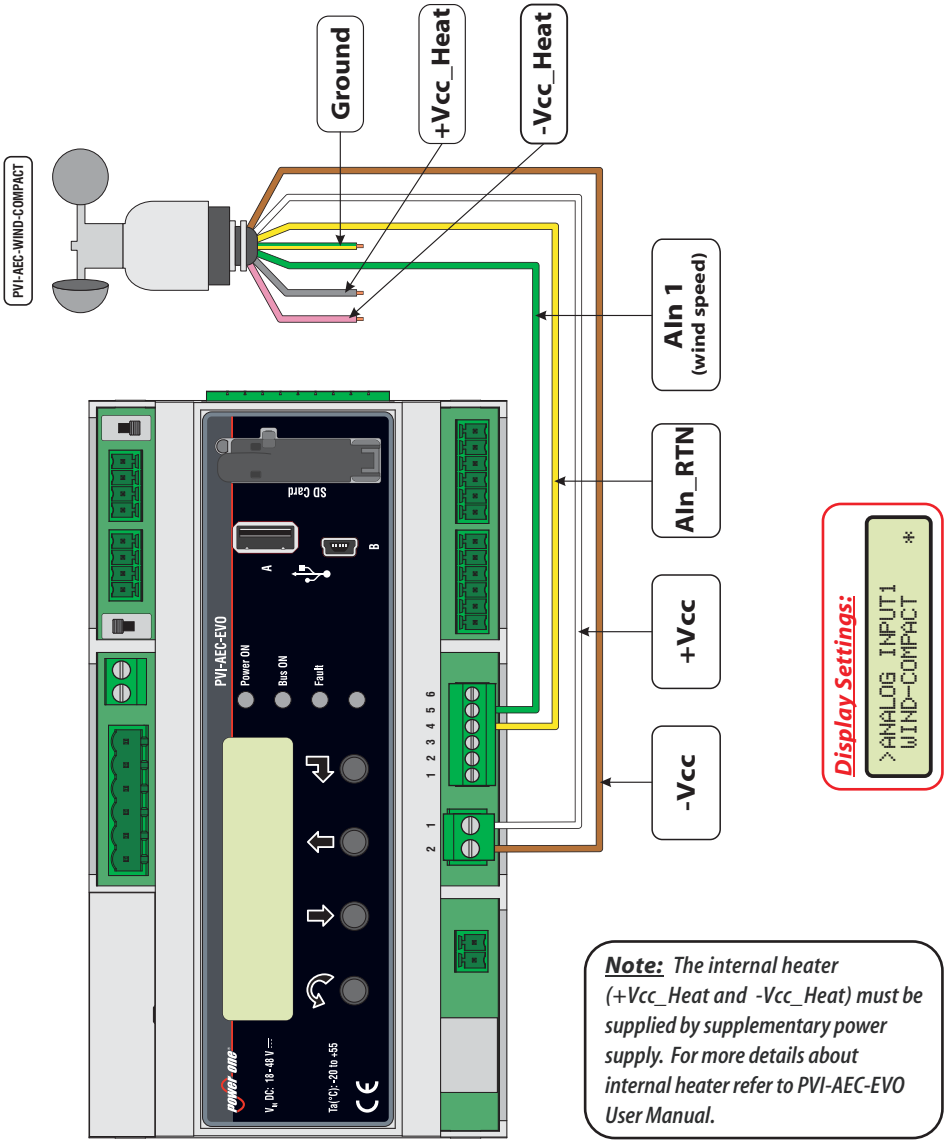
Wiring Diagrams for the Sensors PVI-AEC-IRR / PVI-AEC-RAD-13TC



Wiring Diagrams for the Sensors PVI-AEC-IRR-T / PVI-AEC-RAD-13-TC-T

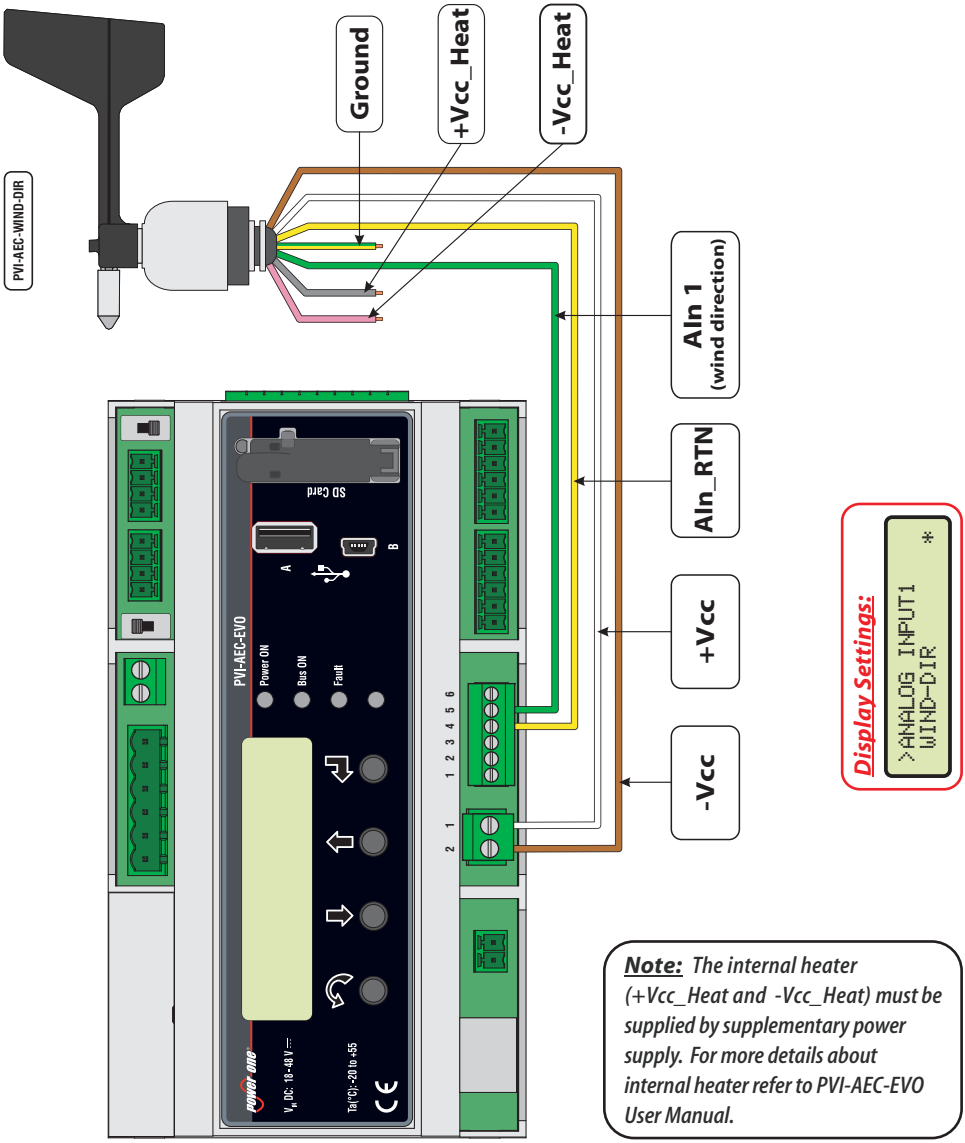


Wiring Diagrams for the Sensors PVI-AEC-PYR-1300



Note: *The internal heater (+Vcc_Heat and -Vcc_Heat) must be supplied by supplementary power supply. For more details about internal heater refer to PVI-AEC-EVO User Manual.*

Wiring Diagrams for the Sensor PVI-AEC-WIND-COMPACT

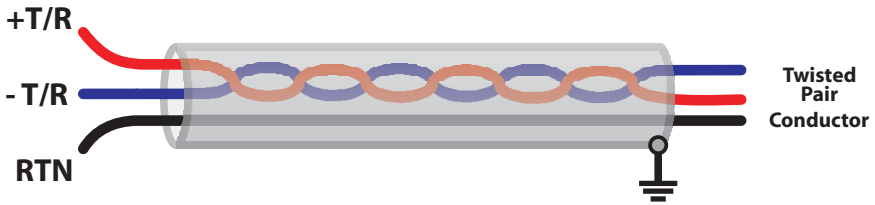


Note: *The internal heater (+Vcc_Heat and -Vcc_Heat) must be supplied by supplementary power supply. For more details about internal heater refer to PVI-AEC-EVO User Manual.*

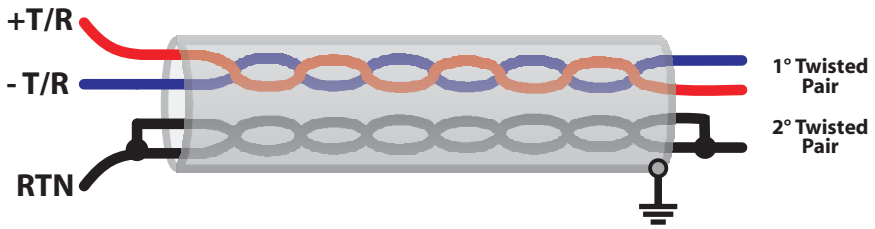
Wiring Diagrams for the Sensor PVI-AEC-WIND-DIR

2. RS485 Cable Specification

SINGLE TWISTED PAIR RS485 CABLE SPECIFICATION	
Type of Cable	RS485 EIA Application
Cable Structure	1 twisted pair + 1 single conductor, shielded
AWG	22 - 24
Charateristic Impedance	120 Ω
Working Frequency	1 kHz / 1 MHz
Capacitance	<50pF / m



DOUBLE TWISTED PAIR RS485 CABLE SPECIFICATION	
Type of Cable	RS485 EIA Application
Cable Structure	2 twisted pairs, shielded
AWG	22 - 24
Charateristic Impedance	120 Ω
Working Frequency	1 kHz / 1 MHz
Capacitance	<50pF / m



3. Display flow-charts

MAIN PAGE

- **INFORMATION**
  - **PRODUCT**
    - *PN*
    - *SN*
    - *FIRMWARE AVR*
    - *FIRMWARE BOOTLOADER*
    - *FIRMWARE ADC_IO*
    - *FIRMWARE DISPLAY*
  - **NETWORK**
    - *CURRENT IP ADDRESS*
    - *CURRENT SUBNET*
    - *CURRENT GATEWAY*
    - *MAC ADDRESS*
  - **GSM/GPRS**
    - *MODEM STATUS*
    - *MODEM SIGNAL*
    - *MODEM ACTIVITY*
  - **GEO COORDINATES**
- **CURRENT VALUE**
  - **ENERGY INVERTERS**
    - *INVERTER N.0*
    - *....*
  - **ENERGY RACK**
    - *RACK N.0*
    - *....*
  - **ENERGY PLANT**
    - *ACTUAL POWER*
    - *DAILY ENERGY*
    - *ENERGY (WEEK)*
    - *ENERGY (MOUNTH)*
    - *ENERGY (YEAR)*
    - *ENERGY (TOTAL)*
  - **ANALOG VALUE**
    - *AN1*
    - *AN2*
    - *TEMP*
  - **DIGITAL VALUE**
    - *D1*
    - *....*
    - *D6*
  - **PULSE VALUE**
    - *PULSE 1*
    - *PULSE 2*
- **SETTINGS** [1]
  - **DATALOGGER** [1]
    - *NETWORK*
    - *SET DATE*
    - *SET TIME*
  - **IO SETTINGS** [1]
    - *ANALOG INPUT 1*
    - *ANALOG INPUT 2*
    - *DIN 1-4*
    - *DIN 6/IN_CONT 1*
    - *DIN 5/IN_CONT 2*
    - *PULSE OUT1*
    - *PULSE OUT2*
  - **UPGRADE FIRMWARE** [1]
    - *UPGRADE AVR*
    - *UPGRADE ADC_IO*
    - *UPGRADE DISPLAY*
  - **DOWNGRADE FIRMWARE** [1]
    - *FAT0*
    - *FAT1*
    - *FAT2*
    - *FAT3*
  - **CHECK WEB UPGRADE** [1]
  - **RESET WEB PASSWORD** [1]
    - *CONFIRM RESET*
  - **UPGRADE CONFIG** [1]
  - **ALIGNMENT TIME** [1]
  - **COM2 CONFIG** [1][2]
    - *USED FOR MODEM*
    - *USED FOR INTERPRETER*
  - **REFRESH DEVICE ID** [1]
  - **CLEAN ALL DEVICES** [1]
- **CHANGE PASSWORD**
  - **USER PASSWORD**
    - *INSERT USER PASSWORD*
  - **ADM PASSWORD** [1]
    - *INSERT ADM PASSWORD*

[1] - Command available only with Admin password.

[2] - Command not available.

4. Compliance Requirements

power-one®
Changing the Shape of Power

PVI-AEC-EVO (CE Declaration) 2012-02-09

Declaration of Conformity

CE MARKING

We, **Power-One Italy S.p.a., Via San Giorgio, 642, I-52028 Terranuova Bracciolini (AR),** declare under our sole responsibility that the products

PRODUCT: Data Logger
MODELS: PVI-AEC-EVO & PVI-AEC-EVO LIGHT
(without Bluetooth version)

to which this declaration relates, is in compliance with the following documents:

Quality Standard(s):	**ISO 9001:2008**
Directives:	**2006/95/EC (Low Voltage Directive)** **2004/108/EC (EMC Directive)**
Safety Standard(s):	**EN 60950-1:2006 + A11:2009**
EMC Standards:	**EN 55022:2006 + A1:2007** **EN 55024:1998 + A1:2001 + A2:2003**

This Declaration of Conformity is not valid any longer, in case, without any written authorization by Power-One Italy S.p.a.:
- the products are modified, supplemented or changed in any other way ;
- components, which are not part of the accessories kit, if any, are integrated in the products ;
- the products are used or installed improperly.

(Manufacturer)	*(Place)*	*(Date)*
Robert P. White Jr. (Director of Safety)	Camarillo, CA	2012 February 09

Power-One Italy, S.p.A.
52028 Terranuova Bracciolini (Ar) – Via S.Giorgio, 642 – Tel. +39 055.9195.1 – Fax +39 055.9195.248 – Fax +39 055.9195.263 *(purch. dept.)*
Capitale Sociale € 22.000.000 int. vers. – C.C.I.A.A. Arezzo n. 101220 – Reg. Imp. E Cod. Fisc. 09286180154 – Partita I.V.A. 01574720510
Società soggetta alla direzione e controllo della Power-One Inc.

power-one®
Changing the Shape of Power

DECLARATION OF CONFORMITY

Manufacturer:	POWER-ONE ITALY SPA
Trade Name:	POWER-ONE
Product Name:	DATA LOGGER
Product Model Number:	PVI-AEC-EVO

These devices comply with Part 15 of the FCC Rules

Operation is subject to the following conditions:

1. The devices may not cause harmful interference, and
2. The devices must accept any interference received, including interference that may cause undesired operation

RESPONSIBLE PARTY

Responsible Party: POWER-ONE INC.

Address: 740 CALLE PLANO, CAMARILLO, C.A. 93012 – USA

Telephone: (805) 987-8741

Date: May 31, 2011

Robert P. White Jr.

(Director of Safety)

Signature:

power-one
Changing the Shape of Power

rif. PVI-AEC-EVO (FCC Declaration of Conformity) rev. 2

Declaration of Conformity

We, **Power-One Italy S.p.a, Via San Giorgio, 642, I-52028 Terranuova Bracciolini (AR), Italy,** declare under our sole responsibility that the product:

PRODUCT: Data Logger
MODEL: PVI-AEC-EVO

to which this declaration relates, is in compliance with the technical requirements of the following Standard(s) and/or technical specifications:

47 CFR FCC Part 15.105, 15.107, 15.109

This Declaration of Conformity is not valid any longer, in case, without any written authorization by Power-One Italy S.p.a.:
- the product is modified, supplemented or changed in any other way ;
- components, which are not part of the accessories kit, if any, are integrated in the product ;
- the product is used or installed improperly.

(Manufacturer)
Ing. Giuseppe Ricci
(Site Director)

Terranuova B.ni *(Place)*

2012 March 20 *(Date)*

Power-One Italy, S.p.A.
52028 Terranuova Bracciolini (Ar) – Via S.Giorgio, 642 – Tel. +39 055.9195.1 – Fax +39 055.9195.248 – Fax +39 055.9195.263 *(purch. dept.)*
Capitale Sociale € 22.000.000 int. vers. – C.C.I.A.A. Arezzo n. 101220 – Reg. Imp. E Cod. Fisc. 09286160154 – Partita I.V.A. 01574720510
Società soggetta alla direzione e controllo della Power-One Inc.

NOTE: The Model PVI-AEC-EVO has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FC
Power-One
PVI-AEC-EVO